

Claims:

1. An expression cassette including a sequence encoding an insulin secretory signal operably linked to a heterologous sequence encoding a polypeptide.
- 5 2. An expression cassette according to claim 1, wherein the insulin secretory signal has the amino acid sequence shown as SEQ ID NO:1.
- 10 3. An expression cassette according to claim 1, wherein the insulin secretory signal is a modified insulin secretory signal comprising modifications of the insulin secretory signal having the amino acid sequence shown as SEQ ID NO:1, wherein said modifications do not deleteriously affect the biological activity of the insulin secretory signal.
- 15 4. An expression cassette according to any one of claims 1 to 3, wherein the heterologous sequence encodes a polypeptide selected from hormones, cytokines, receptor agonists, receptor antagonists, pheromones, and enzymes.
- 20 5. An expression cassette according to claim 4, wherein the polypeptide is a growth hormone.
- 25 6. An expression cassette according to claim 5, wherein the polypeptide is somatotropin.
- 30 7. An expression cassette according to any of claims 1 to 6, further including one or more regulatory elements to enable pulsatile expression of the heterologous sequence.
8. A vector including an expression cassette according to any one of claims 1 to 7.
9. A recombinant cell which includes an expression cassette according to any one of claims 1 to 7.
- 35 10. A recombinant cell according to claim 9, wherein the cell is a bacterial, yeast, insect or mammalian cell.

11. A recombinant cell according to claim 10, wherein the cell is a mammalian cell.

5 12. A mammalian cell according to claim 11, wherein the cell is a rat myoblast (L6) cell.

Sub C4
10 13. A method of producing a polypeptide which includes culturing a recombinant cell of any one of claims 9 to 12 under conditions enabling the expression and secretion of the polypeptide and optionally isolating the polypeptide.

Sub D3
15 14. A capsule for implantation in a host, the capsule including a semi-permeable membrane encapsulating recombinant cells according to any one of claims 9 to 12.

Sub C5
20 15. A capsule according to claim 14, wherein the semi-permeable membrane is an alginate-poly-L-lysine-alginate (APA) membrane.

25 16. A method of administering a polypeptide to a host, wherein said method includes administering to the host an expression cassette according to any one of claims 1 to 7.

30 17. A method of administering a polypeptide to a host, wherein the method includes implanting in the host a capsule according to claim 14 or 15.

Sub D3
35 18. A method according to claim 16 or 17, wherein the host is an animal or human.

19. A method according to claim 18, wherein the host is a livestock animal.

20. A method according to claim 19, wherein the livestock animal is a pig.

21. A method of administering somatotropin to a pig, wherein the method includes implanting in the pig a capsule including a semi-permeable membrane encapsulating recombinant cells, said recombinant cells including and expressing an expression cassette including a sequence encoding an
5 insulin secretory signal operably linked to a heterologous sequence encoding somatotropin, wherein said membrane is permeable to the expressed somatotropin.

10 22. A method according to claim 21, wherein the insulin secretory signal has the amino acid sequence shown as SEQ ID NO:1.

15 23. A method according to claim 21, wherein the insulin secretory signal is a modified insulin secretory signal comprising modifications of the insulin secretory signal having the amino acid sequence shown as SEQ ID NO:1, wherein said modifications do not deleteriously affect the biological activity of the insulin secretory signal.

20 24. A method according to any one of claims 21 to 23, wherein the recombinant cells are mammalian cells.

25 25. A method according to claim 24, wherein the mammalian cells are rat myoblast (L6) cells.

30 26. A method according to any one of claims 21 to 25, wherein the semi-permeable membrane is an alginate-poly-L-lysine-alginate (APA) membrane.

27. A method according to any one of claims 21 to 26, wherein the pig is implanted with one or more capsules sufficient to achieve secretion of somatotropin of at least 30 ng/ml.